



# The National Children's Study

## Report to the Secretary's Advisory Committee on Genetics, Health, and Society

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# Outline of Presentation

## Background

### Rationale for The National Children's Study

## Current Status

### Recent Milestones

### Study Plan

## Future Timeline





# PL 106-310: Children's Health Act of 2000



- ✍ (a) PURPOSE - ... to authorize NICHD to conduct a national longitudinal study of environmental influences (including physical, chemical, biological, and psychosocial) on children's health and development.
- ✍ (b) IN GENERAL - The Director of NICHD shall establish a consortium of representatives from appropriate Federal agencies (including the CDC and EPA) to:
  - ✍ (1) plan, develop, and implement a prospective cohort study, from birth to adulthood, to evaluate the effects of both chronic and intermittent exposures on child health and human development; and
  - ✍ (2) investigate basic mechanisms of developmental disorders and environmental factors, both risk and protective, that influence health and developmental processes...



# Study Concepts

- ✍ Longitudinal cohort study, beginning prior to birth continuing through age 21 years
- ✍ National in scope
- ✍ Study of environmental influences on children's health and development
  - ✍ Environment defined broadly (physical, chemical, biological, and psychosocial)
- ✍ Study designed to allow measurement of both chronic and intermittent exposures



# Study Concepts

- ✍ Hypothesis driven with primary outcomes related to child health and development
- ✍ Study common range of “environmental” exposures and less common outcomes
- ✍ Environment & gene-environment interactions
- ✍ Consortium of multiple agencies
- ✍ National resource for future studies



# Why focus on children?

 Children have:

-  Increased vulnerability to environmental exposures
-  Critical windows of vulnerability during development
-  Immature mechanisms for detoxification and protection
-  Differences in metabolism and behavior that may yield higher exposure in the same environments



## Physiological and behavioral factors that increase exposures in children\*



Factors	Infants	Children	Adults
<b>Surface Area : Body Mass Ratio (m<sup>2</sup>/kg)</b>	<b>0.067</b>	<b>0.047</b>	<b>0.025</b>
<b>Respiratory Ventilation Rate (ml/kg/m<sup>2</sup> lung surf. area/min)</b>	<b>133</b>		<b>2</b>
<b>Drinking water intake (ml/kg/day)</b>	<b>43.5</b>	<b>35.5</b>	<b>19.9</b>
<b>Soil Ingestion (mg/day)</b>		<b>20</b>	<b>0.4</b>
<b>Rate of lead absorption</b>	<b>42-53%</b>	<b>30-40%</b>	<b>7-15%</b>

\*Selevan et al. Environ Health Perspect 2000;108(suppl 3);451



# Why now?

- ✍ Increasing concern about numerous exposures
- ✍ Increasing concern about diseases and conditions of children
- ✍ Growing experience with effects of exposures: lead, fetal alcohol, etc.
- ✍ Technological capabilities: genome, IT, measurement, tracking

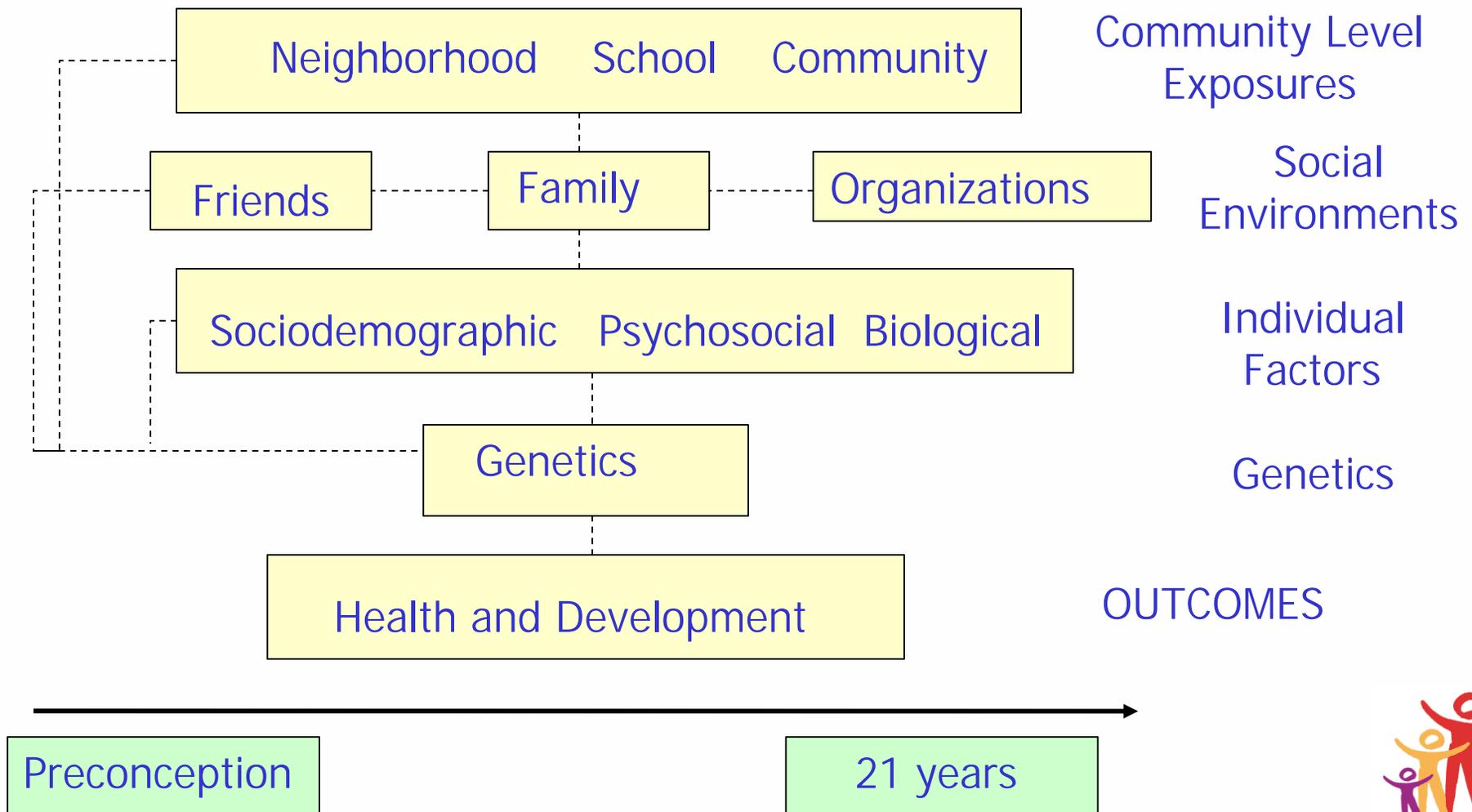


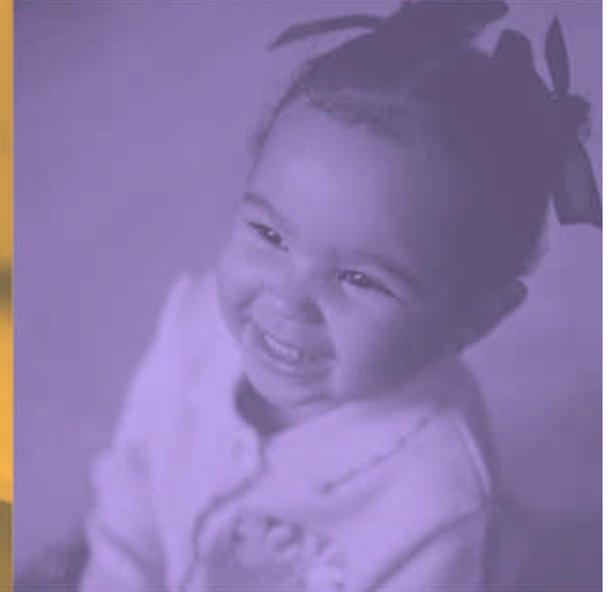
# Why a Longitudinal Study?

- ✍ Allows inference regarding causality
- ✍ Allows study of multiple outcomes and multiple exposures
- ✍ Allows study of mediating pathways between exposure and disease
- ✍ Recall bias in relation to exposure is minimized
- ✍ Facilitates study of developmental trajectories



# Multiple Levels of Measurement





# Recent Milestones and Current Status



## Recent Milestones

- ✍ Decision to utilize a National Probability Sample - June 2004
- ✍ Study Plan Presented to the Federal Consortium – September 2004
- ✍ Request for Proposals –Vanguard Centers - November 2004
- ✍ Request for Proposals -Coordinating Center - November 2004
- ✍ Publication of the Growing up Healthy November 2004



# The National Probability Sample

## ✍ 1<sup>st</sup> Stage

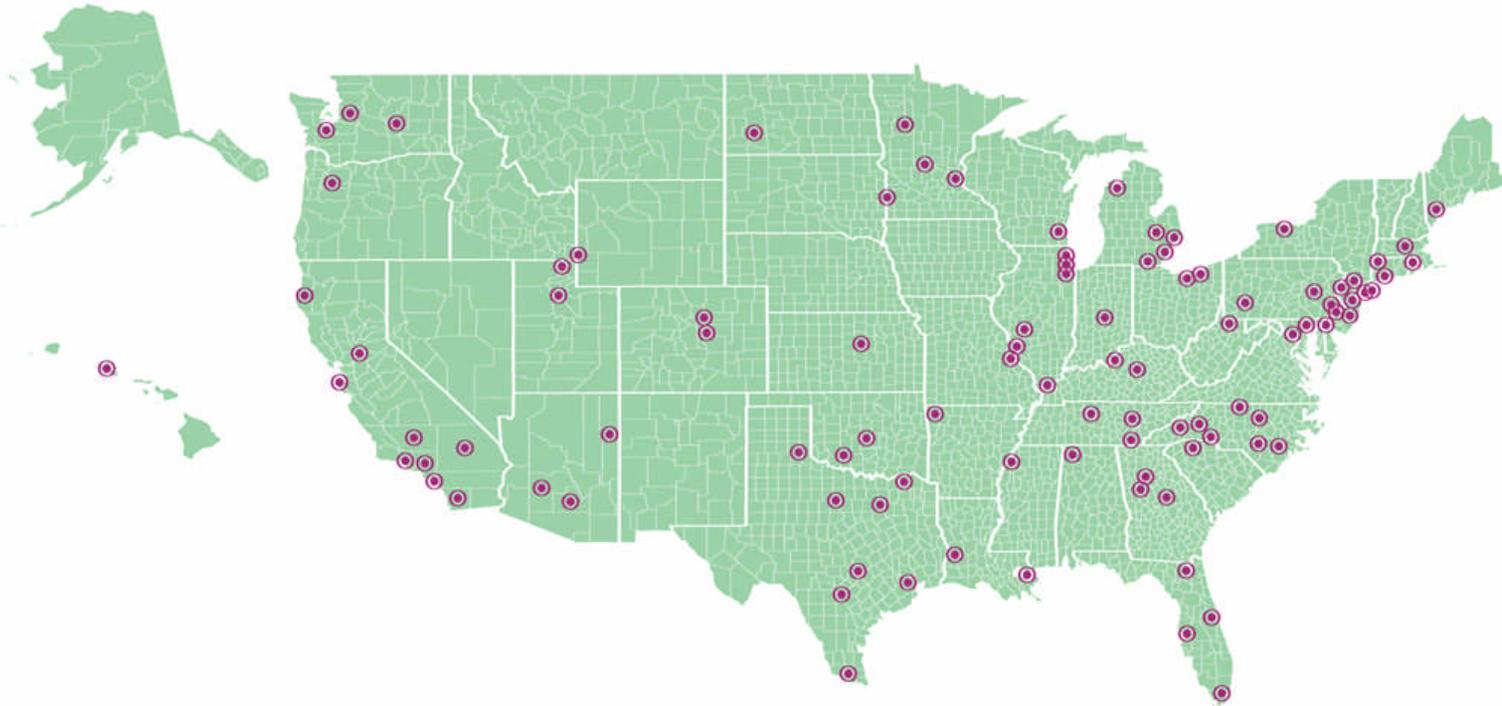
- ✍ 101 study locations drawn from the full list of all counties in the United States
- ✍ 13 self representing locations, 62 metropolitan, 26 non-metropolitan locations

## ✍ 2<sup>nd</sup> Stage

- ✍ Selecting segments or groups of households within the study locations
- ✍ Anticipate a highly clustered sample to facilitate study of community characteristics and logistical efficiency
- ✍ Solicit input from the successful offerors to help define the segments
- ✍ To maintain the integrity of the sample, offerors will not be involved in the actual selection of segments

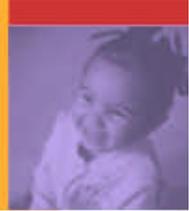


# National Children's Study Locations





# Selection of Vanguard Locations

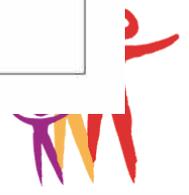
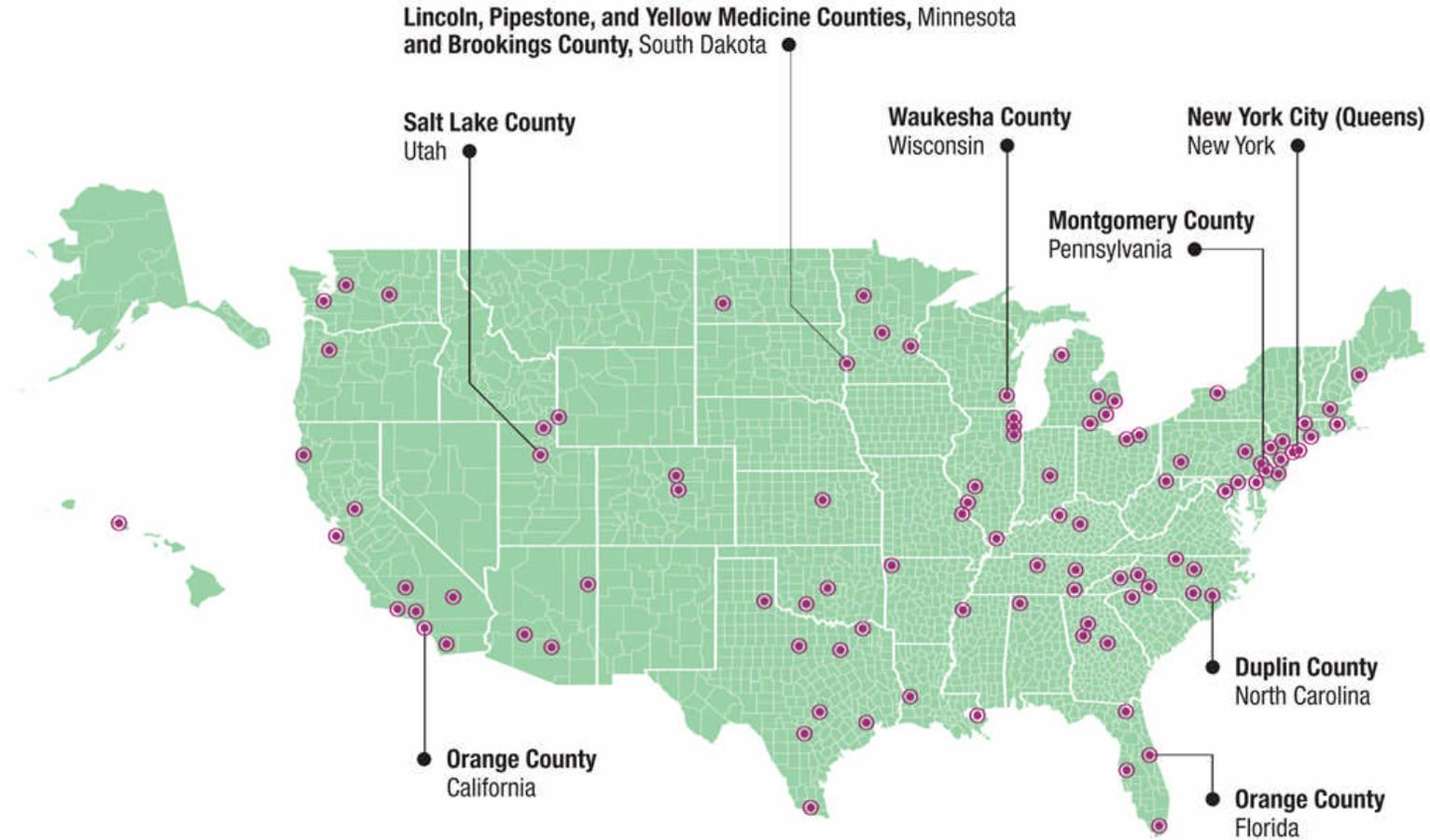


- ✍ From the initial list of Study Locations, eight locations were selected to potentially serve as the Vanguard Locations
- ✍ 2 certainty, 4 metropolitan, non-certainty, 2 non-metropolitan
- ✍ 2 Locations in each of the 4 U.S. Census Regions



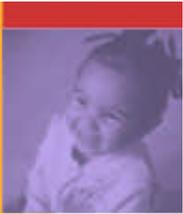
# National Children's Study Locations

Vanguard locations identified by name





# Anticipated Awards



- ✍ The number of awards that are made is dependent on availability of funds and the quality of proposals received
- ✍ Anticipate a total of 3-8 awards
- ✍ There will be no more than 1 award for collection of data in a single location
- ✍ If there are three awards, our goal is to make one award in each of the three categories of certainty, non-certainty, and non-metropolitan
- ✍ If there are 4 awards, our goal is to have one Vanguard Location in each of the four census regions



# Other Aspects of the Study Plan

- ✍ Enrolling women and their partners prior to or early in pregnancy, with follow-up of children until 21 years of age
- ✍ Enrollment is over a four-year period
- ✍ Data will be collected in both face-to-face visits and remote data collections
  - ✍ Questionnaires and Interviews
  - ✍ Environmental samples and observations
  - ✍ Clinical and behavioral assessments
  - ✍ Biologic samples
    - ✍ Blood, Urine, Cord Blood, Placenta, Breast milk



# Proposed Schedule of Visits

Screening	18 months (Home)
Preconception	3 years (Clinic)
1 <sup>st</sup> Trimester (home)	5 years (Clinic)
2 <sup>nd</sup> Trimester (clinic)	7 years (Home)
3 <sup>rd</sup> Trimester (clinic)	9 years (Clinic)
Delivery	12 years (Clinic)
1 month (Home)	16 years (Home)
6 months (Home)	20 years (Clinic)
12 months (Home)	



# Challenges

- ✍ Combination of a probability sample with actual data collection conducted through Centers of Excellence
- ✍ Collect multiple levels of data in a variety of settings
  - ✍ Environmental specimens in the home
  - ✍ Biologic samples at the time of delivery
  - ✍ Measures in the community
- ✍ Capture both intermittent and chronic exposures
- ✍ Capture exposures during critical periods of development

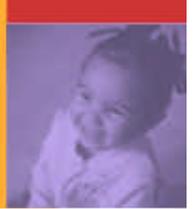


# Projected Time Line

- |                  |   |
|------------------|---|
| Early 2005       | Closing date for receipt of proposals for Vanguard Centers and Coordinating Center                                |
| <b>Late 2005</b> | <b>Select initial centers</b>   |
| 2006             | Complete and pilot initial protocol   |
| Early 2007       | Enroll first participants with initial centers  |
| <b>2006-2007</b> | <b>Select additional centers</b>  |
| 2009-2010        | First preliminary results available from pregnancy  |
| 2007-2030        | Analyze data as collection continues, publish results throughout: hypothesis specific, public use datasets, RFA's |
| Ongoing          | Periodic meetings, peer reviews, workshops, consultations   |



# Workshop on Collection and Use of Genetic Information



- ✍ Brought together experts in the federal government (NIH, EPA, CDC, FDA) to explore opportunities and challenges, and provide recommendations to the NCS
- ✍ Focus on appropriate collection and storage of biologic samples
- ✍ Workshop report and recommendations will be available on the National Children's Study website



# Contact Information

- ✍ Check the Web site:  
<http://NationalChildrensStudy.gov>
- ✍ Join the listserv for news and communication
- ✍ Contact us at [ncs@mail.nih.gov](mailto:ncs@mail.nih.gov)

